

# RARE AND ENDEMIC PLANTS OF THE BIG THICKET: A PHYTOGEOGRAPHICAL ANALYSIS

Michael H. MacRoberts and Barbara R. MacRoberts

*Bog Research, 740 Columbia  
Shreveport, Louisiana 71104, U.S.A. and  
Herbarium, Museum of Life Sciences  
Louisiana State University in Shreveport  
Shreveport, Louisiana 71115, U.S.A.*

## ABSTRACT

The Big Thicket of southeastern Texas ranks relatively high with respect to species richness of rare Texas plants and near the top for West Gulf Coastal Plain endemics. Xeric sandylands, bogs, wetland pine savannas, prairies, and barrens support most of these species.

## RESUMEN

El Big Thicket del sureste de Texas se sitúa relativamente alto con respecto a la riqueza de especies de plantas raras de Texas, y cerca del máximo para los endemismos de la West Gulf Coastal Plain. Los arenales xéricos, pantanos, sabanas húmedas de pino, praderas, y lugares vacíos es donde están la mayoría de estas especies.

## INTRODUCTION

As part of a continuing study of the biogeography of the Big Thicket region of southeastern Texas (Brown et al. 2002, 2005, 2006a, 2006b, 2008; MacRoberts & MacRoberts 2004, 2007, 2008; MacRoberts et al. 2002c, 2007, in prep) in this paper we investigate Big Thicket rare and endemic plants.

## METHODS

Using the Carr (2005) and Poole et al. (2007) annotated lists of rare Texas species and several sources for state distribution (e.g., Turner et al. 2003; Carr 2005; Diggs et al. 2006; Poole et al. 2007), we mapped rare species richness (defined as being the number of rare taxa per county) across Texas. The Carr (2005) sample consists of 450 species and includes all G3/T3 and rarer taxa. We modified the Poole et al. (2007) list to include only G2G3/T2T3 and rarer species, making that sample consist of 201 taxa. G and T ranks are discussed in Poole et al. (2007). Using Kartesz and Meacham (2005) and the *Flora of North America* (1993–2006), we mapped Big Thicket rare species across North America.

Using the MacRoberts et al. (2002b) list of West Gulf Coastal Plain endemics and a grid of 17 quadrats of equal size measuring about 130 km on a side and data on plant distribution from Thomas and Allen (1993–1998), Turner et al. (2003), and Diggs et al. (2006), we plotted endemic plant richness in the West Gulf Coastal Plain.

We define the Big Thicket region as Newton, Jasper, Tyler, Hardin, Polk, San Jacinto, and northern Liberty counties. A map showing the area constituting the West Gulf Coastal Plain is in MacRoberts et al. (2002b, 2007) and Diggs et al. (2006).

## RESULTS

Figure 1 shows the distribution of rare Texas species by county for the Carr (2005) list. Figure 2 shows the distribution of rare Texas species by county for the modified Poole et al. (2007) list. In the Carr (2005) list, the Big Thicket region has 31 rare species. The modified Poole et al. (2007) list has 10 rare species. Figure 3 shows the distribution of West Gulf Coastal Plain endemic species by region. The Big Thicket has 69 West Gulf Coastal Plain plant endemics.



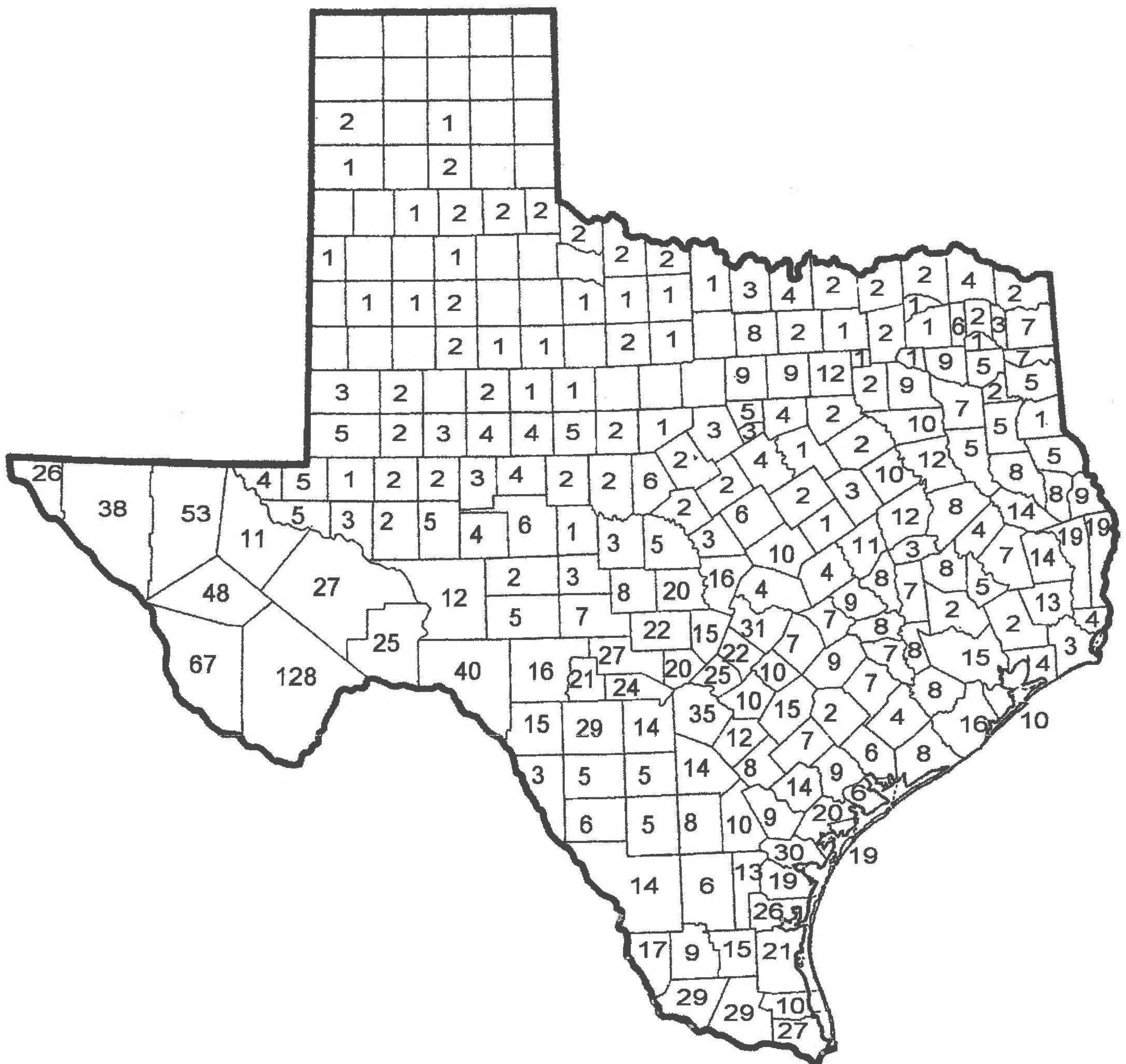


FIG. 1. Distribution of rare Texas plants by county using the Carr (2005) list. The lack of a number indicates an absence of rare species.

#### DISCUSSION

In the Carr (2005) list, the Trans-Pecos region has by far the greatest number of rare species in the state, followed by the eastern part of the Edwards Plateau, the Coastal-Bend, and southern Texas (see also Diamond et al. 1997; Dobson et al. 1997). The Pineywoods region and specifically the eastern edge of the Big Thicket (Newton and Jasper counties) follows these areas. None of the Big Thicket region rare species is western. In the Carr (2005) list, all Big Thicket rare plants are either eastern, notably southeastern, (45%) (e.g., *Platanthera chapmanii*, *Agrimonia incisa*, *Rhynchospora macra*, *Xyris scabrifolia*), or West Gulf Coastal Plain endemics (55%) (e.g., *Bartonia texana*, *Rudbeckia scabrifolia*, *Trillium pusillum* var. *texanum*, *Yucca cernua*). The communities in which Big Thicket region rare species occur are xeric sandylands (26%), bogs/wetland pine savannas (26%), upland pineland (13%), barrens (13%), and baygalls (10%). The remaining 12% are divided among mixed hardwood forest, swamp, and bottomland hardwood forest.

In the modified Poole et al. (2007) list, the same pattern occurs as in the Carr (2005) list except it is less extreme. Nine of the Big Thicket rare species in this list are endemic to the West Gulf Coastal Plain



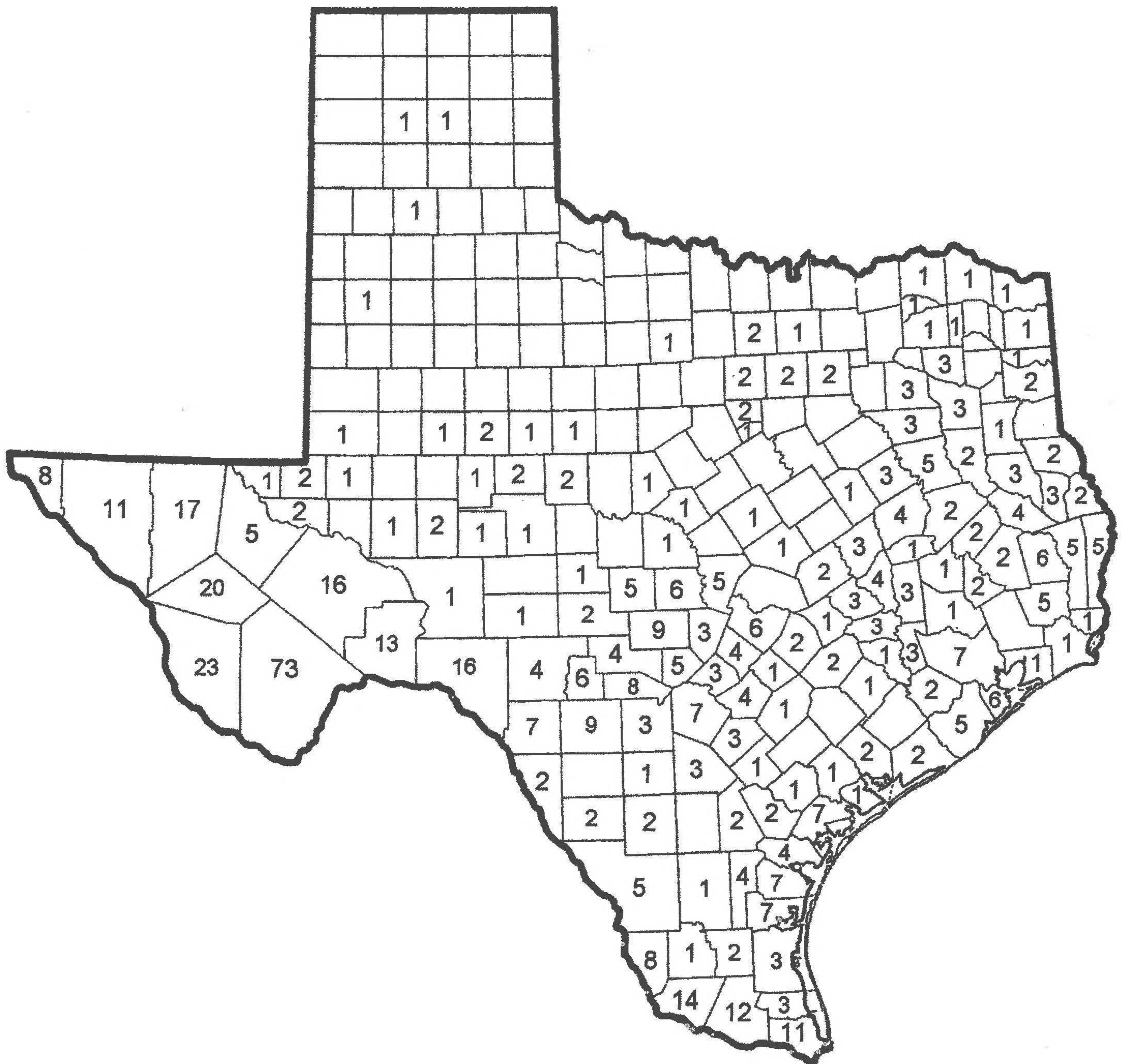


FIG. 2. Distribution of rare Texas plants by county using the modified Poole et al. (2007) list. The lack of a number indicates an absence of rare species.

and one is southeastern. In this list, rare Big Thicket species occur in baygalls, bogs, prairies, barrens, dry uplands, and xeric sandylands.

The Big Thicket region is rich in West Gulf Coastal Plain endemics. It is second only to the region just to its west centered on Montgomery, Walker, Houston, Leon, Madison, Grimes, Brazos, and Robertson counties. The reason for this high incidence of West Gulf Coastal Plain endemics in the Big Thicket region is the presence of xeric sandylands (MacRoberts et al. 2002a; MacRoberts & MacRoberts 2006; Diggs et al. 2006), notably at the Roy Larsen Sandylands Sanctuary (Matos & Rudolph 1985). Xeric sandylands account for about 50% of West Gulf Coastal Plain endemics (MacRoberts et al. 2002b; MacRoberts & MacRoberts 2006) and about 59% of those in the Big Thicket region. Most of the remainder of the Big Thicket region endemics (29%) are in bogs, wetland pine savannas, barrens, baygalls, and prairies. The higher frequency of West Gulf Coastal Plain endemics just west of the Big Thicket is due to its slightly higher incidence of xeric sandyland endemics combined with prairie, bog, and barren endemics.

The Big Thicket, therefore, fares well in Texas and the West Gulf Coastal Plain with respect to rare and endemic species. It ranks in the top half for richness of rare Texas species and near the top for West Gulf



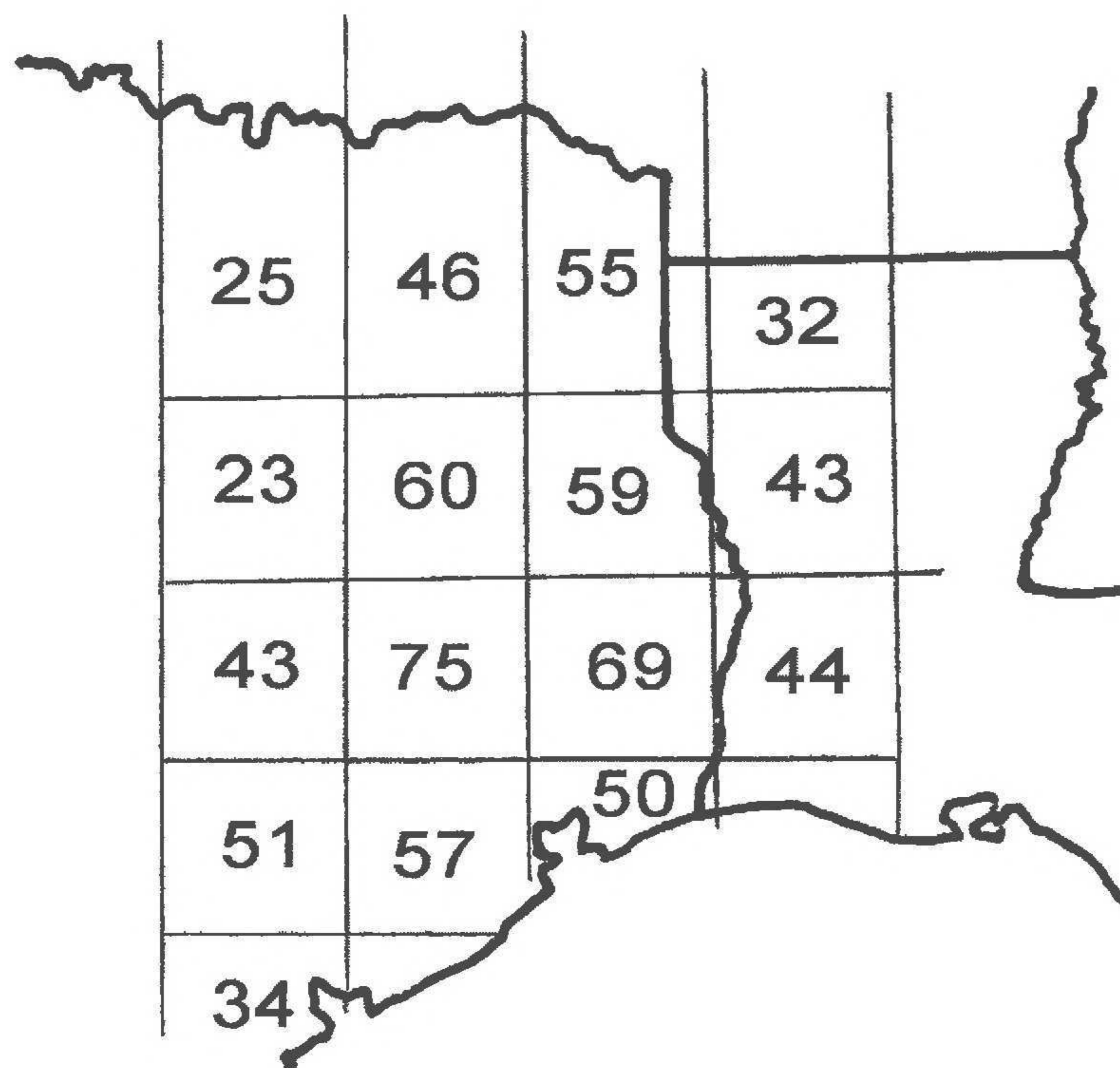


FIG. 3. West Gulf Coastal Plain endemics by quadrat.

Coastal Plain endemics, pinpointing important habitat for conservation, notably xeric sandylands, bogs, wetland pine savannas, prairies, and barrens. Since rare and endemic plant lists are subject to change because of taxonomic research, distributional discoveries, and other factors, these results are, of course, tentative and future lists will undoubtedly provide changes in the results presented here.

#### ACKNOWLEDGMENTS

Amanda C. Lewis, Museum of Life Sciences, Louisiana State University in Shreveport, aided with the figures. Jackie Poole provided many useful comments on the paper.

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